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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/707,816	11/07/2000	Noriaki Sugawara	NEC N00204	6776

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EXAMINER	
SHENG, TOM V	

ART UNIT	PAPER NUMBER
2673	

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/707,816	SUGAWARA ET AL.	
	Examiner	Art Unit	
	Tom V Sheng	2673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2004 and 24 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) *2,6,10,14 and 17-32* is/are withdrawn from consideration.

5)☒ Claim(s) *5,7,8,13,15 and 16* is/are allowed.

6)☒ Claim(s) *1,3,4,9,11,12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3, 4, 9, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Art in view of Kobayashi et al. (US Patent 6483496 B2).

As to driving method claim 1 and associated driving circuit claim 9, Admitted Art teaches a driving circuit (figure 19) for a color liquid crystal display (LCD 1) comprising:

a first gamma compensating circuit (gamma compensation circuit 4_1) for applying a gamma compensation only to a red video signal (S_{RC}) for an independently applied voltage in said color liquid crystal display and for outputting only a compensated red video signal (S_{RG});

a second gamma compensating circuit (gamma compensation circuit 4_2) for applying a gamma compensation only to a green video signal (S_{GC}) for an independently applied voltage in said color liquid crystal display and for outputting only a compensated green video signal (S_{GG});

a third gamma compensating circuit (gamma compensation circuit 4_3) for applying a gamma compensation only to a blue video signal (S_{BC}) for an independently applied voltage in said color liquid crystal display and for outputting only a compensated

blue video signal (S_{BG});

a reference voltage generating circuit (reference voltage generating circuit 3) for supplying generated reference voltages (V_L, V_M, V_H) to said first gamma compensating circuit, said second gamma compensating circuit and said third gamma compensating circuit; and

a data electrode driving circuit (data electrode driving circuit 8) for driving corresponding electrodes (data or column electrodes) of said color liquid crystal display based on said compensated red video signal, said compensated green video signal and said compensated blue video signal.

Admitted Art further shows that transmittance characteristics of red, green and blue liquid crystal cells are different with respect to applied voltage (figures 22 and 24). However, Admitted Art does not teach gamma compensations suitable only for red transmittance characteristics in the first gamma compensating circuit, suitable only for green transmittance characteristics in the second gamma compensating circuit, and suitable only for blue transmittance characteristics in the third gamma compensating circuit. Moreover, Admitted Art does not teach a reference voltage generating circuit supplying respectively independently generated reference voltages to the first, second and third gamma compensating circuits.

Kobayashi teaches a reference voltage control circuit 100 (see figures 3 and 8). For each color, there is an adder 121(r, g, b) for adding a common brightness data BD and a sub-brightness data SBR, SBG or SBB that is specific to the characteristics of each of the RGB lines. Further, there is a selector 111(r, g, b) for selecting either an

image data (DR, DG, DB) during the effective display period or a reference voltage data (CDR, CDG, and CDB) during the blanking period. See column 6, lines 10-33. Furthermore, the image data and reference voltage data are D/A converted afterwards by the D/A converter 2 and then sent to RGB driver 3 for driving LCD 4.

Kobayashi further teaches that by using different reference voltage data (CDR, CDG, CDB) and corresponding reference voltages, an optimum driving voltage can be applied for every RGB color to the LCD 4 in order to perform high quality display with high color reproducibility. See column 6, lines 39-61.

It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Admitted Art's reference voltage generating circuit in view of Kobayashi's teaching such that independently generated reference voltages would be supplied to respective gamma compensating circuits due to the different transmittance characteristics of each color, because the display would be adjusted to the optimum transmittance characteristics of each color at each video signal input and resulting in accurate and high quality display.

As for claims 3, 4, 11 and 12, both Admitted Art and Kobayashi teach using independent reference voltages for the color signals, and further Admitted Art teaches how transmittance vary for each of the three primary colors (figures 22 and 24) from a minimum transmittance to a maximum transmittance that would allow one of ordinary skill in the art to utilize. Further, since the transmittance characteristics are independent, the reference voltage or data are naturally independently changeable.

Allowable Subject Matter

3. Claims 5, 7, 8, 13, 15 and 16 are allowed.

4. The following is a statement of reasons for the indication of allowable subject matter: none of the prior arts of record teaches as for claim 5, the recitation "said gamma compensation including a first gamma compensation of voluntarily giving a luminance of a reproduced image to an input image luminescence and a second gamma compensation of said signals conforming to a red transmittance characteristics, a green transmittance characteristics and a blue transmittance characteristics of a red video signal, a green video signal and a blue video signal, respectively" and other limitations of the claim, and as for claim 13, the recitations "a first gamma compensating circuit for applying gamma compensation only to a red video signal, said gamma compensation including a first gamma compensation ... and a second gamma compensation ...", "a second gamma compensating circuit for applying gamma compensation only to a green video signal, said gamma compensation including a first gamma compensation ... and a second gamma compensation ...", and "a third gamma compensating circuit for applying gamma compensation only to a blue video signal, said gamma compensation including a first gamma compensation ... and a second gamma compensation ..." and other limitations of the claim. Claims 7 and 8 are dependent on claim 5. Claims 15 and 16 are dependent on claim 13.

Response to Arguments

5. Applicant's arguments filed on 11/23/2004 and 11/24/2004 have been fully considered but they are not persuasive.

The applicant argues that the reference voltage control circuit 100 of Kobayashi supplies references voltage CD (CDR, CDG, CDB) for R, G and B color to the clamping circuit 35; whereas the reference voltage generating circuit of the instant application supplies respective reference voltages to respective first, second and third gamma compensating circuits. The Examiner disagrees because even though the above statement is true, the rejection is based on the teaching of independent reference voltages in combination with respective first, second and third gamma compensating circuits taught by the APA.

The applicant argues that a clamping circuit 35 clamps the reference voltage level of the analog RGB signal based on a brightness control signal and each sub-brightness control signal, which is turned on only within the blanking period of the RGB image signals; whereas the driving circuit as claimed applies independent gamma compensations by supplying respectively, independently generated reference voltages to each of a plurality of gamma compensating circuits. Again, even though the above statement is true, the rejection is based on combination the teaching of independent reference voltages of Kobayashi in APA's use of separate gamma compensating circuits and the understanding that transmittance characteristics of each color is different.

The applicant argues that Kobayashi's signal processor circuit 1 performs brightness and contrast control and gamma correction differently. Further, the object of

Kobayashi's device is to achieve an optimum brightness, not to achieve optimum gamma compensation, which is the object of the present invention. The Examiner disagrees because even though Kobayashi's objective is to achieve optimum brightness, the teaching of independent reference voltages allows one of ordinary skill in the art to provide optimal gamma compensations by providing independent gamma reference voltages according to respective transmittance characteristics of the red, green and blue colors.

The applicant argues that adding a common brightness data BD to the sub-brightness data SB (SBR, SBG, SBB) would seems to somehow reduce or eliminate the independency of the sub-brightness data. This is not true because the common brightness data BD is equally applied to the sub-brightness data SB.

Finally, the applicant argues that for Kobayashi, the amplitude of each of the image signals to be displayed on the screen is not varied or controlled, during the effective display period; whereas the amplitude of each of the video signals to be displayed on the screen is varied or controlled by supplying a respectively independently generated reference voltage to achieve an optimum gamma compensation during the effective display period. The Examiner disagrees because even though the amplitude of the image signals are not changed, the image signals to be displayed are controlled by the addition of the reference voltage data CD (CDR, CDG, CDB) to the corresponding digital data DR, DG and DB (column 6, lines 47-51). Moreover, as discussed, it is the teaching of independent reference voltages, not the

particular circuits or type of reference voltages, of Kobayashi that is used in combination with APA's gamma compensation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom V Sheng whose telephone number is (571) 272-7684. The examiner can normally be reached on 9:00am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (571) 272-7681. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Sheng
March 9, 2005

Amare Mengistu
Primary Examiner